



PATENT SPECIFICATION

647,442

Date of filing Complete Specification July 8, 1949.

Application Date July 8, 1948.

No. 18410/48.

Complete Specification Published Dec. 13, 1950.

Index at acceptance:—Class 40(v), Q1k.

PROVISIONAL SPECIFICATION

Improvements relating to Electrical Screening

We, GEORGE SHAND, of 27, Cranford Avenue, Sale, in the County of Chester, JACK GORDON MCQUEEN, of 3, Marlborough Road, Sale, in the County of Chester, both Subjects of the King of Great Britain, and METROPOLITAN-VICKERS ELECTRICAL COMPANY LIMITED, of St. Paul's Corner, 1—3, St. Paul's Churchyard, London, E.C.4, a British Company, do hereby declare the nature of this invention to be as follows:—

This invention relates to enclosures formed of high conductivity material as commonly used for the electrical screening of radio apparatus and in particular to such enclosures having doors, lids, or panels which are likely to be frequently opened for access to the enclosed apparatus and are herein referred to for brevity as removable covers. With such enclosures, especially as employed for the screening of ultra high frequency apparatus, when the removable cover is closed it should always be in good electrical connection with the remainder of the enclosure.

In one arrangement for achieving good electrical connection between the screening enclosure and a removable cover therefor, there are attached to the cover at intervals along its periphery and on its inner face metal fingers of phosphor bronze or like springy material, having their free ends curved out of the plane of the cover inwardly towards the enclosure so as to make wiping contact with the inner sides of the enclosure.

With this arrangement, however, the metal fingers are liable to become broken or distorted when the cover is removed and especially so if the latter is utilised as a tray for supporting relatively heavy apparatus.

In an improved screening enclosure having a removable cover (which may or may not be utilised as a supporting tray for apparatus to be enclosed) according to the present invention the removable cover is formed, or otherwise provided along its periphery, with an inturned flange or a

plurality of distributed flanges and there are attached on the outside of said flange or flanges at intervals along the periphery of the cover a plurality of springy metal fingers, each finger being curved outwardly from the flange and round the edge of the cover so as to overhang the latter to some extent on its outer side.

With this arrangement, when the cover is being closed or opened, the fingers make resilient wiping contact along their outer faces with the inner sides of the enclosure but in such manner that the efficacy of the contacts between the fingers and the walls of the enclosure can readily be ascertained even with the removable cover in closed position; another advantage of the arrangement is that the contact fingers are less liable to mechanical damage; a still further advantage is that the necessity for tight manufacturing tolerances as regards the dimensions of the cover and the opening in the enclosure with which the cover fits is obviated.

In carrying out the invention, the contact fingers may be formed of any suitable springy high conductivity metal, such for example as phosphor bronze; preferably, however, beryllium copper is used for the purpose inasmuch as it is less liable to fatigue. The contact fingers may conveniently be in the form of strips curved to the appropriate shape which, in general, is in the form of a relatively flat straight portion, adapted to lie along a substantial portion of the inturned flange of the cover, and a segmental portion roughly of semi-circular form into which the straight portion merges at an oblique angle, and which is intended to flex during movement of the cover into and out of position the contact fingers may be secured to the flange or flanges in any suitable manner, for instance by riveting or welding.

It will be appreciated that in the converse arrangement of enclosure and cover, namely in which the latter is larger than the opening in the enclosure, the springy metal fingers would be attached to the

inside face of the peripheral flange(s) of the cover and curved inwardly therefrom for engagement with the outside of the enclosure and then outwardly round the edge of the flange so as to overhang the flange on its outer side.

Dated the 8th day of July, 1948.

J. W. RIDDING,
Chartered Patent Agent,
162, Shaftesbury Avenue,
London, W.C.2,
Agent for the Applicants.

COMPLETE SPECIFICATION

Improvements relating to Electrical Screening

We, GEORGE SHAND, of 27, Cranford Avenue, Sale, in the County of Chester, JACK GORDON McQUEEN, of 3, Marlborough Road, Sale, in the County of Chester, both Subjects of the King of Great Britain, and METROPOLITAN-VICKERS ELECTRICAL COMPANY LIMITED, of St. Paul's Corner, 1-3, St. Paul's Churchyard, London, E.C.4, a British Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to enclosures formed of high conductivity material as commonly used for the electrical screening of electrical apparatus and in particular to such enclosures having doors, lids, or panels which are likely to be frequently opened for access to the enclosed apparatus and are herein referred to for brevity as removable covers. With such enclosures, especially but not exclusively as employed for the screening of ultra high frequency apparatus, when the removable cover is closed it should always be in good electrical connection with the remainder of the enclosure.

In one known arrangement for achieving good electrical connection between the screening enclosure and a removable cover therefor, there are attached to the cover at intervals along its periphery and on its inner face metal fingers of phosphor bronze or like springy material, having their free ends curved out of the plane of the cover inwardly towards the enclosure so as to make wiping contact with the inner sides of the enclosure. With this arrangement, however, the metal fingers are liable to become broken or distorted when the cover is removed and especially so if the latter is utilised as a tray for supporting relatively heavy apparatus.

In another known arrangement for a metal encased radio receiver the cover is formed with a flange which surrounds the side walls of the casing and good contact between cover and casing is achieved by the provision of detachable spring metal U-shaped clips placed over the edge of the casing at the opening thereof, said clips having one (or each) arm bowed so that the clip is engaged by the flange of

the cover when the latter is in place on the casing.

The present invention comprises an electrical screening enclosure of the kind having a removable electrically conductive cover for an opening in the enclosure in which the cover is formed or otherwise provided along its periphery with a flange or a plurality of distributed flanges, and there is fixed on the or each of said flanges one or more closely spaced springy metal fingers, each finger being curved outwardly or inwardly away from the flange face, for engagement with the inner or outer face of the opening of the enclosure.

With this arrangement, when the cover is being closed or opened, the fingers make resilient wiping contact within or externally of the walls of the opening of the enclosure but in such manner that the efficacy of the contacts between the fingers and the walls of the enclosure can readily be ascertained even with the removable cover in closed position; another advantage of the arrangement is that the contact fingers are less liable to mechanical damage; a still further advantage is that the necessity for tight manufacturing tolerances as regards the dimensions of the cover and the opening in the enclosure with which the cover fits is obviated.

In carrying out the invention, the contact fingers may be formed of any suitable springy high conductivity metal, such for example as phosphor bronze; preferably, however, beryllium copper is used for the purpose inasmuch as it is less liable to fatigue. The contact fingers are conveniently in the form of strips curved to the appropriate shape which, in general, is in the form of a relatively flat straight portion, adapted to lie along a substantial portion of the flange of the cover, and a segmental portion roughly of semi-circular form into which the straight portion merges at an oblique angle, and which is intended to flex during movement of the cover into and out of position; the contact fingers may be secured to the flange or flanges for instance by riveting or welding.

In order that the invention may be clearly understood reference will now be made to the accompanying drawing, in which:—

Fig. 1 is a fragmentary cross-section of a known arrangement for establishing electrical connection between a screening enclosure and a removable cover therefor;

5 Figs. 2 and 3 are respectively a cross-section and side elevation, with part cut away, of one arrangement in accordance with the invention in which the cover is smaller than the opening in the enclosure;

10 Fig. 4 is a cross-section of an alternative form of the arrangement of Figs. 2 and 3; and

15 Figs. 5 and 6 show cross-sections of two further arrangements in each of which the cover is larger than the opening in the enclosure.

Referring to Fig. 1 there is shown a fragment of a known form of screening enclosure arrangement including part of a side wall 1 of an enclosure and part of a removable cover 2, with electrical connection or bonding between these two members effected by fingers 3 of a suitable springy metal, such as phosphor bronze, secured to the inner face of the cover 2. In such arrangement, as will be readily appreciated, the metal fingers 3 are very liable to become distorted or broken when the cover is removed, more especially if it is used as a tray for supporting relatively heavy apparatus.

In the form of the improved arrangement of the present invention shown in 35 Figs. 2 and 3, the removable cover 4 of an enclosure 5 is provided with the peripheral flanges 6, and on the outer faces of these flanges is secured a plurality of springy metal fingers 7 which, as shown, 40 are curved outwardly away from the flange 6 so as to make contact with the inner surface of the walls 8 of the enclosure 5, and then round the edge of the flange so as to overhang the rear face of the flange to some extent.

In such arrangement as compared with that of Fig. 1 the contact fingers 7 are far less likely to be distorted or broken since they will be supported by contact with the 50 edge of the flange 6 if they are exposed to pressure on the cover being laid flat on a supporting surface.

The form of the invention shown in Fig. 4 differs from that of Figs. 2 and 3 55 in that the spring fingers 7 are inverted so as to extend round the corner between the flange 6 and the face of the cover 4, the fingers being curved outwardly away from the flange into position to make contact with the walls 8 of the enclosure 5 60 and then inwardly so that their ends lie along the surface of the cover.

The form of the invention shown in Figs. 5 and 6 is appropriate in cases where 65 the cover 4 is larger than the enclosure

5 and fits with its flanges 6 extending over the outer surfaces of the wall 8 of the enclosure. In such case the springy metal fingers 7 are secured to the inner 70 face of the flanges 6 of the cover 4 and are curved inwardly from the flange, for engagement with the outer surfaces of the walls of the enclosure as shown in Fig. 5, the fingers may extend towards 75 the edge of the flange and be curved outwardly round the edge to overhang the flanges on their outer sides.

Alternatively, as shown in Fig. 6, they may extend towards the join of the flange 6 and cover 4. 80

In a preferred arrangement the springy metal fingers 7 are formed by slotting a continuous strip of suitable metal as shown in Fig. 3, the strip being then 85 secured to the flanges of the cover over their whole length. In some circumstances however, separate fingers may be provided and their length may be commensurate with the length of each flange.

Having now particularly described and 90 ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electrical screening enclosure of 95 the kind having a removable electrically conductive cover for an opening in the enclosure, in which the cover is formed or otherwise provided along its periphery with a flange or a plurality of distributed 100 flanges, and there is fixed on the or each of said flanges one or more closely spaced springy metal fingers, each finger being curved outwardly or inwardly away from the flange face, for engagement with the 105 inner or outer face of the opening of the enclosure.

2. An electrical screening enclosure as 110 claimed in claim 1, wherein the springy fingers are fixed to the outside of the flanges and are curved outwardly away from the flanges towards engagement with the inner surface of the opening walls and then inwardly round the edge of the 115 flanges.

3. An electrical screening enclosure as 120 claimed in claim 1, wherein the springy fingers are fixed to the outside of the flanges and are curved outwardly away from the flanges towards engagement with the inner surfaces of the opening walls and then inwardly towards the corner of the cover and flanges so as to overhang the cover to some extent on its 125 external face.

4. An electrical screening enclosure as 130 claimed in claim 1, wherein the springy fingers are fixed to the inside of external flanges and are curved inwardly away from the flange for engagement with the

outer surfaces of the opening walls and then outwardly round the edge of the flange so as to overhang the flange on its outer side.

- 5 5. An electrical screening enclosure as claimed in claim 1, wherein the springy fingers are attached to the inside of the external flanges and are curved inwardly away from the flange for engagement with
10 the outer surface of the opening walls and then inwardly towards the join of the flange and cover.

6. An electrical screening enclosure as claimed in any preceding claim, wherein
15 the springy fingers are formed from a continuous strip of metal which is slotted at

right angles to its length to provide a plurality of fingers extending transversely of the length of the strip.

7. An electrical screening enclosure 20 having a removable cover substantially as herein described with reference to Figures 2 and 3, or Figure 4, or Figure 5, or Figure 6, of the accompanying drawing: 25

Dated the 8th day of July, 1949.

J. W. RIDDING,
Chartered Patent Agent,
162, Shaftesbury Avenue,
London, W.C.2,
Agent for the Applicants.

Leamington Spa : Printed for His Majesty's Stationery Office by the Courier Press.—1950
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which
copies, price 2s 0d. each (inland) 2s. 1d. (abroad) may be obtained.

SPECIFICATION NO. 647442

By a direction given under Section 17(1) of the Patents Act 1949 this application proceeded in the name of Metropolitan - Vickers Electrical Company Limited, a British Company of St. Paul's Corner, 1-3, St. Paul's Churchyard, London, E. C.4.

THE PATENT OFFICE,
12 December, 1950.

DS 61254/1(26)/3475 160 11/50 R

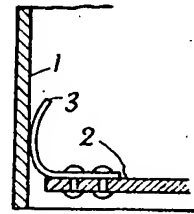


FIG. 1

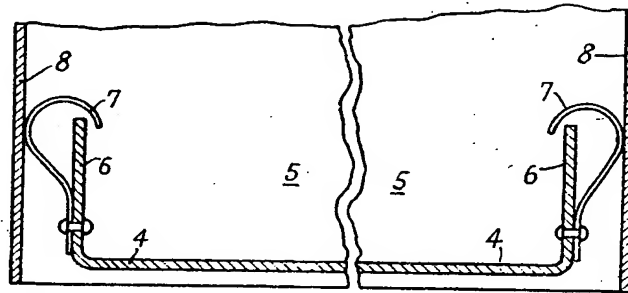


FIG. 2.

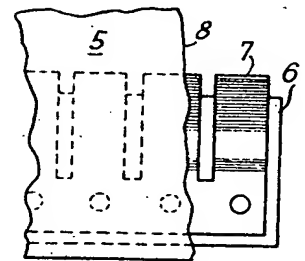


FIG. 3

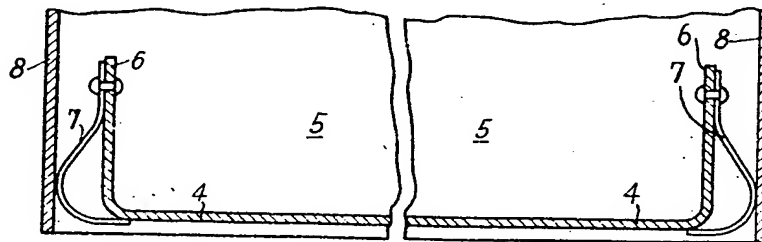


FIG. 4

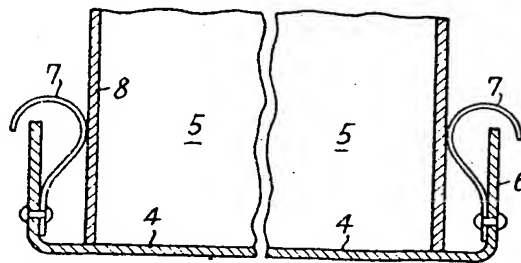


FIG. 5

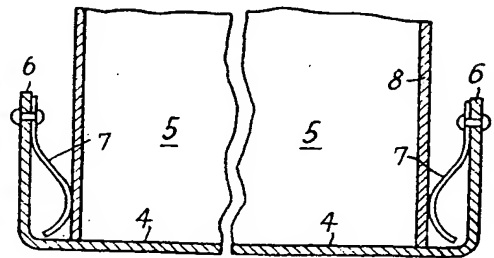


FIG. 6.

[This Drawing is a reproduction of the Original on a reduced scale.]

THIS PAGE BLANK (USPTO)